

CLAIMS

What is claimed is:

1. A method for determining failure rate and selecting a best
5 burn-in time, comprising:
providing a plurality of integrate circuits;
performing a life-time testing process, wherein a failure rate
testing time relation is established by measuring the life-time of each
said integrated circuit under a testing environment, wherein an
acceleration factor function also is established under said testing
environment, said acceleration factor function being related to the
relationship between a testing time of said testing environment and a
real time of a normal operating environment;
15 performing a simulating process, using a testing time function
to simulate said failure rate testing time relation;
performing a transforming process, using said acceleration
factor function to transform said testing time function into a real time
function, wherein a knee point of said real time function corresponds to
an operation time which is said best burn-in time; and
20 performing an integrating process, integrating said real time
function through a calculating region to consult an accumulated failure
rate real time function, wherein said calculating region is a region in
which said real time is larger than said best burn-in time.
- 25 2. The method of claim 1, wherein said failure rate testing
time relation is divided into three periods in according to value of said
testing time, said three periods are a infant mortality period, a normal
life period and a wear out period.

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3. The method of claim 1, wherein said acceleration factor function is a constant.
4. The method of claim 1, wherein said acceleration factor function is a linear function.
5. The method of claim 1, wherein said acceleration factor function is a nonlinear function.
6. The method of claim 1, wherein said testing time function is an exponent function.
7. The method of claim 1, wherein said testing time function is a polynomial of said testing time.
8. The method of claim 1, wherein said testing time function is $y=at^b$, wherein a and b are two variables, y is said failure rate and t is said testing time.
9. ~~The method of claim 1, wherein said simulating process is adjusted to let a last square error between said failure rate testing time relation and said testing time function is minimized.~~
10. ~~The method of claim 1, wherein said simulating process is adjusted to let an error between said failure rate testing time relation and said testing time function is minimized.~~
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11. The method of claim 2, wherein said integrating process is stopped while said testing time in which is corresponds by said testing time is located in said wear out period.

5 12. A method for determining failure rate and selecting best burn-in time, comprising:

 providing a plurality of integrate circuits;

10 performing a life-time testing process, wherein a failure rate testing time relation is established by measuring the life-time of each said integrated circuit under a testing environment, wherein an acceleration factor function also is established under said testing environment, said acceleration factor function being related to the relationship between a testing time of said testing environment and a real time of a normal operating environment;

15 performing a transforming process, using said acceleration factor function to transform said failure rate testing time function into a failure rate real time function,

20 performing a simulating process, using a real time function to simulate said failure rate real time relation, wherein a knee point of said real time function corresponds to an operation time which is a best burn-in time for testing said integrated circuits; and

25 performing an integrating process, integrating said real time function through a calculating region to consult an accumulated failure rate real time function, wherein said calculating region is a region in which said real time is larger than said best burn-in time.

13. The method of claim 12, wherein said failure rate testing time relation is divided into three periods: an infant mortality period, a

normal life period and a wear out period.

14. The method of claim 12, wherein said acceleration factor function is chosen from the group consisting of: constant, linear
5 function and nonlinear function.

15. The method of claim 12, wherein said testing time function is $y=at^b$, wherein a and b are two variables, y is said failure rate and t is said real time.

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16. ~~The method of claim 12, wherein said simulating process is adjusted to let a last square error between said failure rate real time relation and said real time function is minimized.~~

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17. The method of claim 12, wherein said simulating process is adjusted to let an error between said failure rate real time relation and said real time function is minimized.

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18. ~~The method of claim 13, wherein said integrating process is stopped while said testing time in which corresponds by said testing time is located in said wear out period~~

25 *copy 15*
19. A method for determining failure rate and selecting best burn-in time, comprising:

providing a plurality of integrate circuits;
performing a life-time testing process, wherein the life-time of each said integrated circuit is measured under a testing environment and then a failure rate testing time relation is established in accordance

with a plurality of testing records, wherein an acceleration factor function also is established under said testing environment, said acceleration factor function being related to the relationship between a testing time of said testing environments and a real time of a normal operating environment;

5 performing a simulating process, using a testing time polynomial of said testing time to simulate said failure rate testing time relation;

10 performing an optimizing process, part of said testing records are deleted and said corresponding processes are performed again while more than one said integrated circuits are failed before a specific testing time in which is corresponding to a knee point of said testing time polynomial, and said specific testing time is a best testing time of said integrated circuits while only one of said integrated circuits is failed before said specific testing time;

15 performing a transforming process, using said acceleration factor function to transform said specific testing time into a specific real time and also transform said testing time polynomial into a real time polynomial, wherein said specific real time is a best burn-in time for 20 testing said integrated circuits; and

performing an integrating process, integrating said real time function through a calculating region to consult an accumulated failure rate real time function, wherein said calculating region is a region in which said real time is larger than said best burn-in time.

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20. The method of claim 19, wherein said integrating process is stopped while said testing time in which is corresponds by said testing time is located in said wear out period.